GRADE 4 WINTER NATURE WALK

Winter Twig Identification

OBJECTIVES:

- Learn the value of classification in using keys to identify trees.
- Sharpen observation skills.
- Learn the logical step-by-step thinking skills needed to use a dichotomous key.
- Discover how trees grow.
- Use keys to independently identify marked trees in the schoolyard.
- Develop an appreciation for the variety of trees growing in Lexington.

PREPARATION:

- BBY coordinator will mark appropriate trees along the playground perimeter for identification.
- BBY coordinator will collect deciduous and conifer twig specimens for classroom use. Obtain at least 4 twigs of each specimen. Sample twigs should include trees not found in the schoolyard.
- Walk will last approximately 90 min. (45min. in the classroom learning how trees grow, learning how to use ID keys, and identifying specimen twigs and 45 min. outside identifying marked trees in the schoolyard).

MATERIALS:

- Deciduous and conifer twig specimens for classroom use.
- Tree cross sections.
- Each child will need a clipboard, pencil, and a *How to be a Twig Detective* handout.

ACTIVITIES:

- Learn how trees grow.
- Learn how to use the Conifer ID and Deciduous Winter Twig keys.
- Indentify specimen twig samples in the classroom.
- Identify marked trees in the schoolyard.

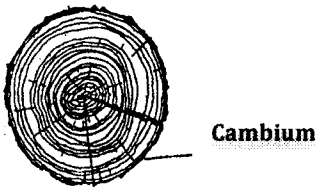
Two important science skills are classifying and careful observation of natural objects. This unit on identifying conifers and deciduous winter twigs enables students to practice both these skills. Students also gain knowledge about trees and how they grow, and a feeling of connectedness with trees and pride in their own abilities as they learn to call familiar trees by name.

This walk has two components:

- In an indoor session children will learn to identify both conifers and deciduous trees through classification and the use of keys.
- Outdoors children will use their new found skills to identify selected schoolyard trees.

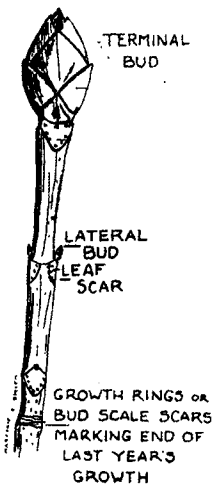
NATURE WALK: TO BE LED BY BIG BACKYARD VOLUNTEER

1. **How trees grow.**
   - Show children a tree cross-section. (*Ask: Have you seen a tree cross-section before?* Pointing to tree rings *Ask: Do you know what these are?)* Show children the cambium layer between the bark and the sapwood—this is where the tree grows new wood each year. Tree trunks and branches grow bigger around each year by adding a new layer of wood just inside the bark



   - Trees grow taller from the top and tip of each branch; trees do not grow up from the bottom. If you hung a swing from a branch and came back in ten years, the swing would still be at the same height from the ground.

   - Show children a twig (Horse chestnut is good for this activity). Show children the leaf scars along the branch just below each bud—this is where last year's leaf was attached. If they look closely they can see the little dots showing where the veins carried sap from the roots to the leaf. Now look at the end or terminal bud: see that it has a line all around the base of the bud. Now look back along the twig until you find line around the twig. This is where last years' terminal bud was and this is how much this branch grew last year.



2. **Introducing the dichotomous keys.**
   - The children will be using dichotomous keys to identify the twigs and trees. A dichotomous key is a key in which you are given choices or asked to answer questions about your specimen that lead to its identification. At each branching

point you are usually given two choices. The children will use two dichotomous keys today: a Conifer Identification Key and a Deciduous Winter Twig Key.

3. **Introducing the Conifer Identification Key.**
   - (*Ask: Does anyone know what the word conifer means?)* Conifer means "cone bearing"—for our purposes we use it to mean "pine tree" or "evergreen tree" a tree that has held on to its leaves in the winter.

4. **Introducing the Deciduous Winter Twig Key.**
   - (*Ask: Does anyone know what the work deciduous means?)* Deciduous means "shed easily or at intervals". A deciduous tree is a tree that looses its leaves seasonally.

   - One way of classifying deciduous trees is by observing the branching pattern. Show the children the sample twig from section 1. By looking at the lateral buds and leaf scars as clues, show them that this twig has an opposite branching pattern. **M**aple, **A**sh, **D**ogwood, and **H**orse chestnut are the only native trees in New England with opposite branching. An easy way to remember this is **MAD Horse**.


Opposite

   - Alternate branching is where the lateral buds and leaf scars alternate down the twig.


Alternate

   - The Deciduous Winter twig Key relies more on observation and comparing a real twig with a drawing. (This in itself is a useful science skill.) But like the Conifer Key, it helps to ask questions and classify each twig before actually observing the bud drawings. By asking and answering specific questions, the student will know in which section of the key to look for identification. The illustrations in the "How to be a Twig Detective" handout can also help the children classify each twig.

   - **It is important to impress on the students the value of moving through the keys step-by-step and not jumping ahead because they think they know the answer. *A key teaches the value of careful observation and a logical step-by-step approach to identification.***

5. **Identifying specimen twig samples.**

   - Break up into small groups. Each group should have an adult to guide the group through the twig identification process.

- Adults will bring specimen twigs to their group one sample at a time.

- The first question to ask is: *Is it a conifer or a deciduous twig?* The answer determines which key the group will use. Children should be following along with their own copy of the key.

- **With deciduous trees ask first:**
  - Are the branches opposite or alternate?

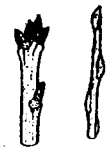

Opposite


Alternate

  - Are there catkins or  thorns? 

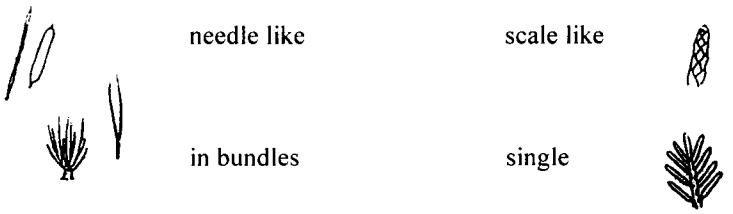
Once they are on the right row of the key, encourage students to look carefully at drawings and read descriptions of similar buds before deciding on their answer.

  - Is the end bud single or in a group?



  - Do the side buds stick out or lay close to the branch?

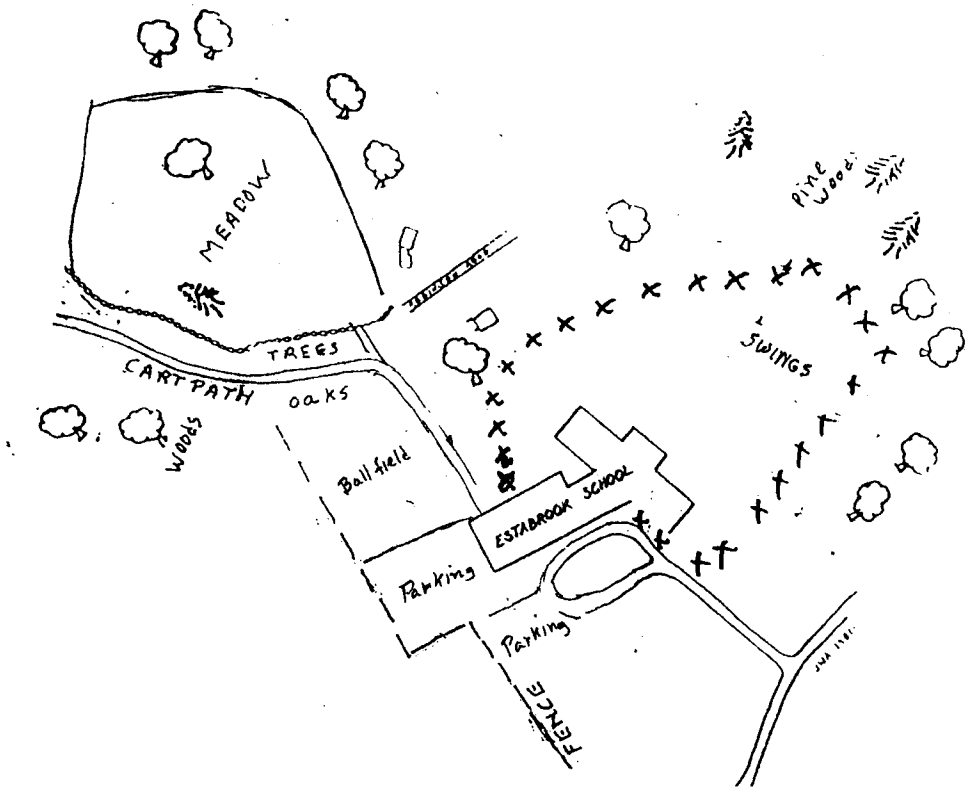
- **With conifer trees follow the key step-by-step from the beginning:**
    - Are the leaves (needles) needle like or scale like?



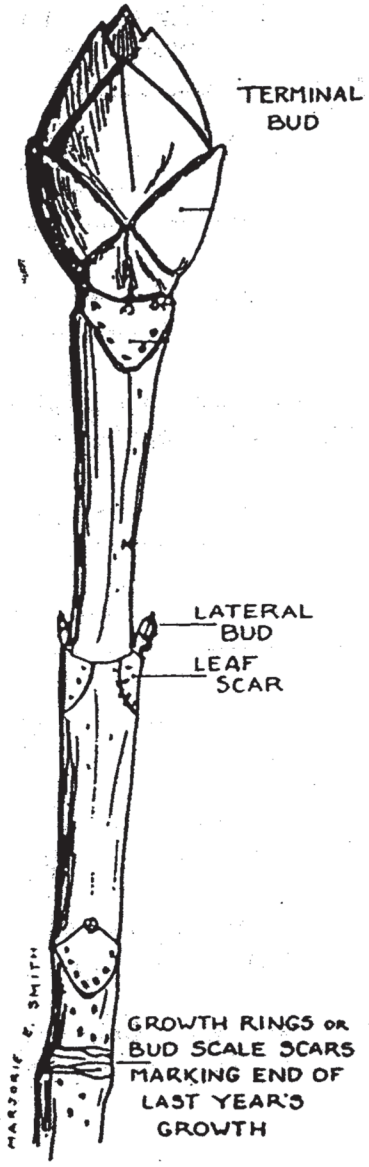
    - Are the leaves (needles) in bundles or single?
    - Read each choice carefully before moving to the next stage.

6. **Identifying marked trees in the schoolyard.**
    - Explain to the students that they will be going out in the schoolyard to identify marked trees. Remind them how important it is to behave like scientists do and work with the keys step-by-step, classifying and observing carefully, never jumping ahead because they think they know the answer.
    - Stagger where the groups start so that there is only one group at a time at any given marked tree.
    - Students will identify the marked trees using their keys and record their answers on their worksheets.

MAP



HOW TO BE A TWIG DETECTIVE



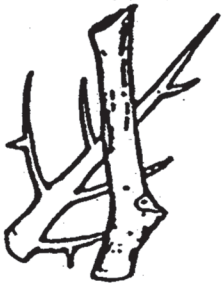
Opposite

Alternate

Terminal buds in a cluster

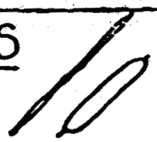
Terminal buds single

Catkins



Thorns

DEFINITIONS



LEAVES NEEDLE-LIKE OR SCALE-LIKE

SINGLE OR IN BUNDLES

CONIFER KEY

LEAVES ..... Needle-like ——— A
Scale-like ——— AA

A – Needle-like ..... in bundles ——— B
single ——— BB

B – in bundles ..... deciduous, many in a bundle ——— LARCH
evergreen, 2-5 in a bundle ——— C

C – evergreen ..... 5 leaves ——— WHITE PINE
2-3 leaves ——— D

D – 2-3 leaves ..... 3 leaves ——— PITCH PINE
2 leaves ——— E

E – 2 leaves ..... leaves about 2" ——— SCOTCH PINE*
leaves over 3" ——— F

F – leaves over 3" ..... leaves usually break when bent double ——— RED PINE
leaves usually do not break when bent ——— AUSTRIAN PINE*

BB – single ..... leaves flat, tips not needle sharp ——— G
leaves not flat, tips needle sharp ——— GG

G – leaves flat, tips not sharp ..... leaves yellow-green below ——— YEW
leaves not yellow-green below ——— H

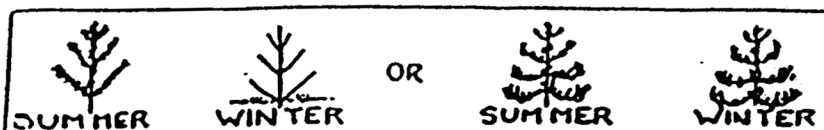
H – leaves not yellow-green below .....
leaves white below ——— tiny stem on leaf ——— HEMLOCK
leaves not white below ——— no stem on leaf ——— BALSAM FIR

GG – leaves not flat, tips sharp .....
leaves 1/2" or longer ——— SPRUCE
leaves 1/4" ——— PASTURE JUNIPER

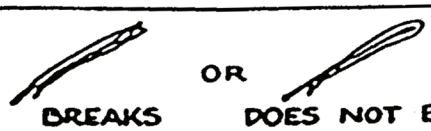
AA – Scale-like ..... branchlets flattened ——— ARBOR VITAE
branchlets not flattened ——— RED CEDAR

MAS #5

MASSACHUSETTS AUDUBON SOCIETY Lincoln, Mass. (*Introduced species)



SUMMER WINTER OR SUMMER WINTER
DECIDUOUS EVERGREEN



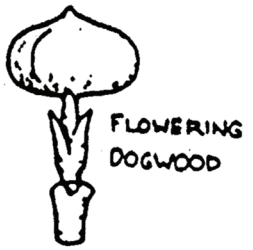
BREAKS OR DOES NOT BREAK
NEEDLE BENT DOUBLE

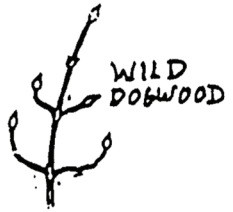
DECIDUOUS WINTER TWIG KEY

BUDS ARE OPPOSITE — GO TO A
BUDS ARE ALTERNATE — GO TO B

A Terminal buds in a cluster

Terminal buds single



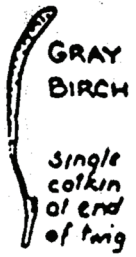


B TWIGS DO NOT HAVE CATKINS OR THORNS — GO TO C
TWIGS HAVE CATKINS OR THORNS — GO TO D

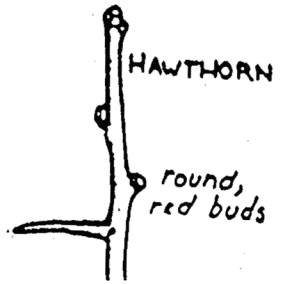
C Terminal buds in a cluster

Terminal buds single

D Catkins



Thorns



Grade Four Winter

Schoolyard Trees

Names_____

_____

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7._____

8._____

9._____

10._____

11._____

12._____